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09/830,752	04/30/2001	Hiroshi Furukawa	Y1929.0079	1996

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DICKSTEIN SHAPIRO LLP  
1177 AVENUE OF THE AMERICAS (6TH AVENUE)  
NEW YORK, NY 10036-2714

EXAMINER
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MOORE JR, MICHAEL J

ART UNIT	PAPER NUMBER
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2619

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12/21/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

Application No.

09/830,752

Applicant(s)

FURUKAWA, HIROSHI

Examiner

Michael J. Moore, Jr.

Art Unit

2619

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 11 October 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 3,4,6,8 and 10 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 3,4,6,8 and 10 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11 October 2007 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Drawings*

1. Replacement drawings were received on 10/11/07. These drawings are acceptable and have been entered.

### *Specification*

2. The disclosure is objected to because of the following informalities: On page 10, line 1, the word "disappear" should be "disappears". Appropriate correction is required.

Amendments made by Applicant to obviate the other objections to the specification provided in the previous Office Action are proper and have been entered. These particular objections have been withdrawn.

### *Claim Objections*

3. Claim **10** is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form.
4. Specifically, claim **10** recites "wherein said equalizing is performed before said demodulating in said equalizing and demodulating step". This fails to further limit "equalizing and then demodulating said modulated signals from said base station" recited in claim **3**.

Amendments made by Applicant to claims **3, 4, 6, and 8** to obviate the claim objections provided in the previous Office Action are proper and have been entered. These particular objections have been withdrawn.

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims **3, 4, 6, 8, and 10** are rejected under 35 U.S.C. 103(a) as being unpatentable over Brajal et al. (U.S. 5,796,814) (hereinafter "Brajal") in view of Applicant's Admitted Prior Art (hereinafter "AAPA") and in further view of Bottomley et al. (U.S. 5,909,465) (hereinafter "Bottomley").

Regarding claim **3**, *Brajal* teaches a receiver in Figure 1B (mobile station), where a transmitter of Figure 1A (base station) modulates signals intended for the receiver as spoken of on column 4, lines 1-31.

*Brajal* also teaches computing means COMPUT 30 of Figure 3 that computes and updates the weight factors of the equalizer (filter), so that its transfer function (frequency characteristics) is the inverse of the transfer function of the channel (frequency characteristics of channel) as spoken of on column 5, lines 42-47, as well as column 2, lines 13-18.

*Brajal* also teaches a deframer 65, deserializer 66, FFT 62, and serializer 60 within demodulation means 24 used for demodulation of the output (generate equalized, demodulated output) from equalizer TEQ 64 as shown in Figure 3 and spoken of on column 5, lines 17-37.

*Brajal* does not teach demodulating independently each of the modulated signals and combining the demodulation results, thereby generating a conventional output.

However, *AAPA* teaches a conventional RAKE receiver for a CDMA system in Figure 5 where a plurality of signal components (modulated signals) are demodulated independently via demodulation units 107 and then combined via combining unit 110 to arrive at received data (conventional output) as spoken of on page 2, line 16 – page 3, line 6 of Applicant's specification.

At the time of the invention, it would have been obvious to someone of ordinary skill in the art, given these references, to combine the RAKE receiver teachings of *AAPA* with the equalization teachings of *Brajal* in order to provide improved signal equalization in a CDMA environment.

*Brajal in view of AAPA* does not teach the selecting of an output with higher communication quality from the equalized, demodulated output and the conventional output.

However, *Bottomley* teaches a method of bidirectional demodulation where a type of demodulation is selected based upon a higher demodulation quality value as spoken of on column 5, lines 37-61.

At the time of the invention, it would have been obvious to someone of ordinary skill in the art, given these references, to combine the demodulation quality selection teachings of *Bottomley* with the equalization and demodulation teachings of *Brajal in view of AAPA* in order to provide an equalization and demodulation scheme providing enhanced output quality as spoken of on column 5, lines 23-29 of *Bottomley*.

Regarding claim 4, *Braj* further teaches an equalizer in Figure 9 containing a plurality of shift cells 80 (delay circuits) connected in series, a plurality of multipliers 81 that each have a weight factor (coefficient) input  $h^n$ , and an summator 85 (adder) that sums (adds) the outputs of the multipliers 81 as spoken of on column 7, lines 57-65.

Regarding claim 6, *Braj* teaches a receiver in Figure 1B (receiving apparatus), where a transmitter of Figure 1A (base station) modulates signals intended for the receiver as spoken of on column 4, lines 1-31.

*Braj* also teaches a demodulation means 24 (first receiving unit, frequency conversion unit having antenna) for extracting the digital baseband data representing the received coded symbols as spoken of on column 4, lines 29-31.

*Braj* also teaches computing means COMPUT 30 (channel estimation unit) of Figure 3 that computes and updates the weight factors of the equalizer (filter unit), so that its transfer function (frequency characteristics) is the inverse of the transfer function of the channel (frequency characteristics of channel) as spoken of on column 5, lines 42-47, as well as column 2, lines 13-18.

*Braj* also teaches a deframer 65, deserializer 66, FFT 62, and serializer 60 within demodulation means 24 (demodulator) used for demodulation of the output from equalizer TEQ 64 as shown in Figure 3 and spoken of on column 5, lines 17-37.

*Braj* does not teach a second receiving unit comprising a demodulation unit that demodulates independently each of the modulated signals and combines the demodulation results.

However, *AAPA* teaches a conventional RAKE receiver for a CDMA system in Figure 5 where a plurality of signal components (modulated signals) are demodulated independently via demodulation units 107 and then combined via combining unit 110 to arrive at received data as spoken of on page 2, line 16 – page 3, line 6 of Applicant's specification.

At the time of the invention, it would have been obvious to someone of ordinary skill in the art, given these references, to combine the RAKE receiver teachings of *AAPA* with the equalization teachings of *Brajai* in order to provide improved signal equalization in a CDMA environment.

*Brajai in view of AAPA* does not teach a selection unit for selecting an output with higher communication quality from the outputs of the first and second receiving units.

However, *Bottomley* teaches a method of bidirectional demodulation where a type of demodulation is selected based upon a higher demodulation quality value as spoken of on column 5, lines 37-61.

At the time of the invention, it would have been obvious to someone of ordinary skill in the art, given these references, to combine the demodulation quality selection teachings of *Bottomley* with the equalization and demodulation teachings of *Brajai in view of AAPA* in order to provide an equalization and demodulation scheme providing enhanced output quality as spoken of on column 5, lines 23-29 of *Bottomley*.

Regarding claim 8, *Brajai* teaches a receiver in Figure 1B (mobile station), where a transmitter of Figure 1A (base station) modulates signals intended for the receiver as spoken of on column 4, lines 1-31.

*Braj* also teaches a demodulation means 24 (first receiving unit, frequency conversion unit having antenna) for extracting the digital baseband data representing the received coded symbols as spoken of on column 4, lines 29-31.

*Braj* also teaches computing means COMPUT 30 (channel estimation unit) of Figure 3 that computes and updates the weight factors of the equalizer (filter unit), so that its transfer function (frequency characteristics) is the inverse of the transfer function of the channel (frequency characteristics of channel) as spoken of on column 5, lines 42-47, as well as column 2, lines 13-18.

*Braj* also teaches a deframer 65, deserializer 66, FFT 62, and serializer 60 within demodulation means 24 (demodulator) used for demodulation of the output from equalizer TEQ 64 as shown in Figure 3 and spoken of on column 5, lines 17-37.

*Braj* does not teach a second receiving unit comprising a demodulation unit that demodulates independently each of the modulated signals and combines the demodulation results.

However, *AAPA* teaches a conventional RAKE receiver for a CDMA system in Figure 5 where a plurality of signal components (modulated signals) are demodulated independently via demodulation units 107 and then combined via combining unit 110 to arrive at received data as spoken of on page 2, line 16 – page 3, line 6 of Applicant's specification.

At the time of the invention, it would have been obvious to someone of ordinary skill in the art, given these references, to combine the RAKE receiver teachings of



*AAPA* with the equalization teachings of *Brajai* in order to provide improved signal equalization in a CDMA environment.

*Brajai in view of AAPA* does not teach a selection unit for selecting an output with higher communication quality from the outputs of the first and second receiving units.

However, *Bottomley* teaches a method of bidirectional demodulation where a type of demodulation is selected based upon a higher demodulation quality value as spoken of on column 5, lines 37-61.

At the time of the invention, it would have been obvious to someone of ordinary skill in the art, given these references, to combine the demodulation quality selection teachings of *Bottomley* with the equalization and demodulation teachings of *Brajai in view of AAPA* in order to provide an equalization and demodulation scheme providing enhanced output quality as spoken of on column 5, lines 23-29 of *Bottomley*.

Regarding claim 10, *Brajai* teaches a deframer 65, deserializer 66, FFT 62, and serializer 60 within demodulation means 24 (demodulator) used for demodulation of the output from equalizer TEQ 64 as shown in Figure 3 and spoken of on column 5, lines 17-37.

### ***Response to Arguments***

7. Applicant's arguments filed 10/11/07 have been fully considered but they are not persuasive.

Regarding claims 3, 4, 6, 8, and 10, Applicant argues that there is no motivation to combine the teachings of *Brajai*, *AAPA*, and *Bottomley*. Applicant further argues that *Bottomley* does not concern a down channel in a CDMA cellular system, and thus could

not be properly combined with the combination of *Braj* and *AAPA*. Applicant further argues that since *Braj* does not explicitly teach the equalization of spread spectrum signals based on the frequency response of a plurality of radio channels in a CDMA environment, that the combination of *Braj* and *AAPA* is improper.

In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

Regarding claims **3, 4, 6, 8, and 10**, it is held that one having knowledge within the level of ordinary skill in the art, given the teachings of these references, would be motivated to combine these teachings for the motivations described above.

As provided above, *Bottomley* teaches a method of bidirectional demodulation where a type of demodulation is selected based upon a higher demodulation quality value (higher communication quality) as spoken of on column 5, lines 37-61.

It is further stated on column 11, lines 57-67 of *Bottomley*, how the teachings of *Bottomley* are also applicable to a CDMA environment.

Also, although the disclosure of *Braj* is directed to an OFDM environment, it is held that one using knowledge within the level of ordinary skill in the art could apply the

teachings of *Brajal* to CDMA given the teachings of *AAPA* and *Bottomley*, as *Brajal* is directed to a digital transmission system including transmitters and receivers that may communicate using wireless channels as spoken of on column 2, lines 19-25.

Further, given these demodulation selection teachings of *Bottomley* along with the equalization teachings of *Brajal* and the RAKE reception teachings of *AAPA*, it is held that it would have been obvious to one of ordinary skill in the art to combine these teachings in order to provide an equalization and demodulation scheme providing enhanced output quality as spoken of on column 5, lines 23-29 of *Bottomley*.

### ***Conclusion***

8. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael J. Moore, Jr. whose telephone number is (571)

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272-3168. The examiner can normally be reached on Monday-Friday (7:30am - 4:00pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wing F. Chan can be reached at (571) 272-7493. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Michael J. Moore, Jr.  
Examiner  
Art Unit 2619

mjm MM

  
12/18/07  
WING CHAN  
SUPERVISORY PATENT EXAMINER